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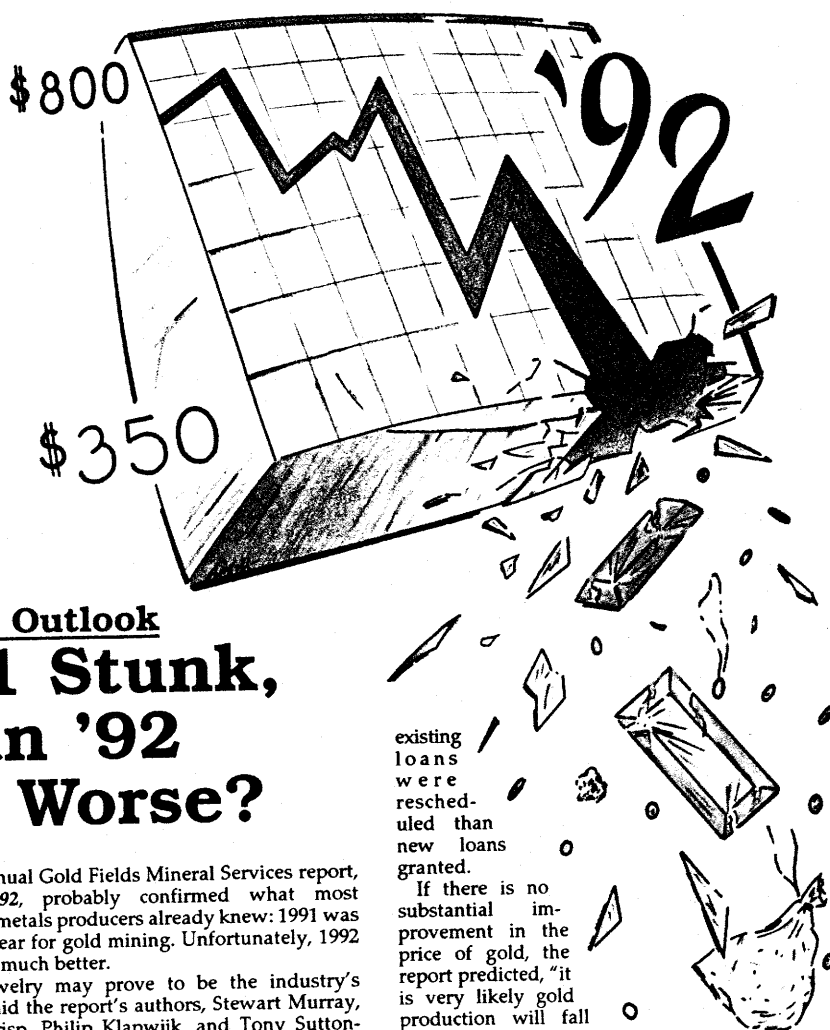
# Mining World News

MAY/JUNE 1992

VOLUME 4 NUMBER 3

FINANCE

## GOLD PRICES



### Gold Outlook

## '91 Stunk, Can '92 be Worse?

The annual Gold Fields Mineral Services report, *Gold 1992*, probably confirmed what most precious metals producers already knew: 1991 was a lousy year for gold mining. Unfortunately, 1992 won't be much better.

But jewelry may prove to be the industry's savior, said the report's authors, Stewart Murray, Kevin Crisp, Philip Klapwijk, and Tony Sutton-Pratt. The team is employed by the Gold Fields Mineral Services Ltd. commodity company based in London, England.

"Mine production is edging towards a plateau if not a peak," the authors wrote, "the slowdown reflecting the increasing difficulty of attracting finance for marginal properties and the depletion, rationalization or closure of some older mines, offsetting increases from new capacity."

Gold supply and demand in the western world was 90.5 million ounces in 1991, the first recent decrease in production, compared to 1990's supply and demand of 93.7 million ounces. The growth in mine production was the smallest increase since 1980, the report said.

For the first time, repayment of gold loans exceeded the demand for new loans in 1991. More

existing loans were rescheduled than new loans granted.

If there is no substantial improvement in the price of gold, the report predicted, "it is very likely gold production will fall off sharply rather than reaching a plateau in the next few years."

"The tenacity of the mining industry in the face of falling real prices attests to the industry's ability to adapt to lower prices but also reflects the infeasibility, in general, of putting many underground mines onto a care and maintenance basis. No such considerations may apply to many of the world's informal miners, however, who have reacted to the falling price by leaving the gold fields, many of which have, in any case, been depleted of their richer ore zones."

A number of high-cost South African mines may close. The three-year-long fall in exploration "seems set to continue in the absence of a recovery

*continued on page 14*

### INTERNATIONAL

## Commonwealth Charts a Rocky Mining Path

As foreign mining and exploration companies rush to do business with the former Soviet republics, they may encounter years of legal wrangling as fledgling mining laws are tested, ethnic groups dispute mineral rights, and the firms grapple with economic and technological problems.

Barriers to foreign investment in the Commonwealth of Independent States include a lack of information on industrial enterprises, poor infrastructure, an unclear decision-making hierarchy, non-convertible or non-existent currencies, and conflicts over ownership rights to resources in numerous autonomous regions. For instance, lengthy wrangling between the Kazakhstan government and Chevron recently produced the biggest partnership to date between a U.S. corporation and a former Soviet republic. The three-year negotiation process may provide

*continued on page 2*

### MINING AND THE ENVIRONMENT

## Paul Rokich Kennecott's Guru of Dry Reclamation

By G.S. Elliott

It was the driest April in 96 years—a fitting time to visit Paul Rokich, dry-land reclamation specialist at Kennecott Utah Copper's Bingham Canyon operation southwest of Salt Lake City. I had heard of his reputation as a modern-day Johnny Appleseed; but, more than that, I hoped he might shed some light on dry reclamation in the inhospitable, arid western U.S.

My first impression of the area, meeting Rokich near the east gate at the base of the 5,000-acre tailings pond at the edge of the Great Salt Lake, was that of green-green grass and bushes, birds singing, bees humming, and, believe it or not, fish jumping in the canal near the parking area. "Not so inhospitable to me," I said to Rokich. "Reclamation

*continued on page 12*

## INSIDE...

- AMAX's Leader Allen Born
- Lone Tree Mine
- Assay Innovation: BLEG

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PAUL ROKICH continued from front page

here must be relatively easy." But that's where I was wrong. "This was all white when we started," Rokich explained, "one great alkali salt flat resulting from overgrazing sheep in the first half of this century."

Like many of today's mines, the Bingham operation inherited environmental ills left over from early timber and grazing activities. Unlike some others, Kennecott and its predecessor, ASARCO, have been focussing on site reclamation for over 30 years. This long-term effort, led primarily by Rokich in his no-nonsense style, has revealed the possibilities of reclaiming mined lands at the edge of the Utah desert.

Growing up in Smelter Camp, Utah, situated beneath what is now the upgraded Kennecott Smelter, Rokich was very familiar with the environmental devastation associated with clear-cut logging, decades of overgrazing, and old-fashioned mining operations. "See those green hills up there?" Rokich pointed to the steep Oquirrh Mountains forming a verdant backdrop to the smelter and Bonneville concentrator. "They were pure black when I was a kid—not a blade of grass or trace of topsoil, just black rock." It was that depressing spectacle that influenced him, at the impressionable age of six years old, to make a lifelong commitment to revegetate what he could of the mining property and neighboring mountains. He wanted to see trees up on that ridge.

Rokich's reclamation is essentially conservative—it had to be. During his now legendary early days, before being hired to do so, he would secretly hike up into the mountains behind the mine and plant trees on his own, seedlings he had dug up or raised in his greenhouse. "I never had any money to plant, or water to give them a start,"

explained Rokich. It was those early experiences, not always successful, that showed Rokich, and later Kennecott, the valuable lessons of dry reclamation.

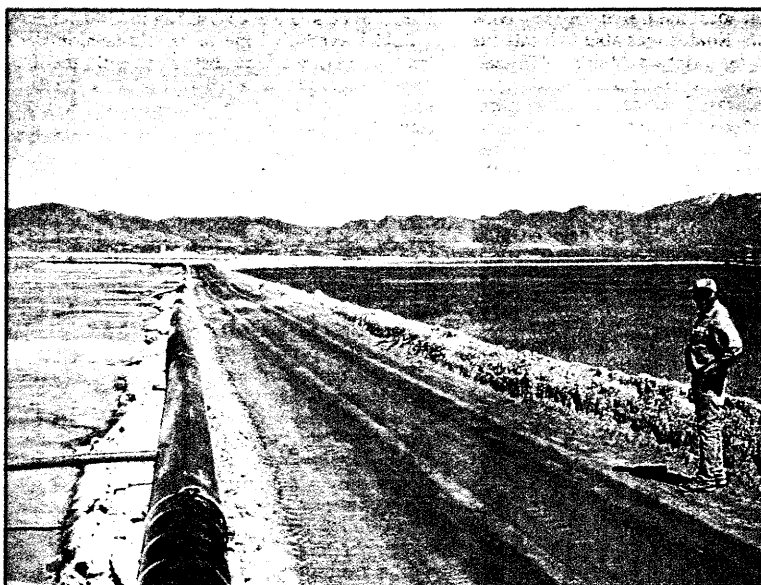
Augmenting his real world experience with a formal education at the University of Utah, Rokich studied botany and natural history. Confessing his reclamation dream to a sympathetic professor, young Rokich was told that it just couldn't be

done, that he would never see those hills green. Traditional wisdom was that, once eroded away, topsoil was gone forever and native plants would never come back. What was underestimated was the tenacity of a man with a life-long dream—tenacity and an understanding of natural processes.

"You can't beat the natural process," Rokich explained, "but you have to understand it first."

Your first priority is to stabilize the soil ... Get your plants started, any plants, stabilize the soil, and let the plant succession begin. Once you set up your grasses you have a trap—a trap to catch dust and wind-blown seeds, then you let nature decide what to grow."

Decades after his initial experiments began, Rokich can now point to many reintroduced native species.



Paul Rokich, Kennecott Reclamation Specialist

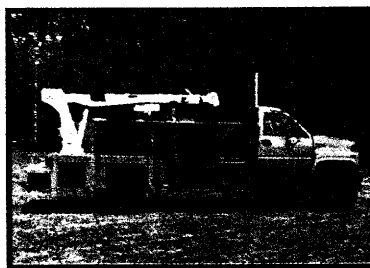
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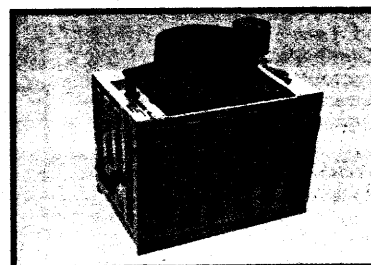
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Being "climax" species, the natives often can't get a start until some soil has developed. How does he know what the original environment and plants were? Study. As a voracious reader, Rokich still spends hours pouring over journals and books.

Years ago he came across a reference to a book by John Muir, founder of the Sierra Club. It seems that Muir hiked the Oquirrh Mountain/Bingham Canyon area not long after the Mormon immigrants settled Utah, and included his observations on the local natural history in a book entitled *Steep Trails*. Rokich was able to locate the out-of-print book and retrace Muir's 1877 trail, learning about original conditions and what might, he hoped, some day become a stable plant community again. "Muir called this the Lily Range, because it was covered in Sego Lilies." These lilies, the state flower, are only now coming back to the Oquirrhs after decades of absence.

Rokich doesn't blame the old miners, shepherds, or lumbermen for devastating his beloved hills, pointing out that everyone treated the land badly back then. "Look at the dust bowl era of the 1930s; those farmers destroyed millions of acres of good farmland. People just didn't understand the land and how to preserve it. Everyone was like that."

Now we know better, but we must put things in perspective. The lesson for today's reclamation workers is that of patience, patience and perseverance. "In the arid West you can't expect anything to happen overnight. We get dry years, then other years it rains at just the right time; nature can be so fickle." We need to look at reclamation long term, hitting areas several times if necessary.

Rokich now routinely replants areas. Starting out with a general grass/forb mixture to get an area started and limit dust, he watches the results. Then, he goes back in and replants the problem areas, perhaps more than once. His latest project came from a step back of the tailings pond dike; 200 acres of recent tailings were drying out and needed reclamation-dust control, which is a major issue this close to Salt Lake City. He told me how

he planted the area himself earlier that spring. It looked like a midwest farm: knee-high barley for what seemed like miles, with other species poking up from below. "The geese love this barley as forage." He pointed to a few spots that were thin, some bare, and told me, "I'll replant those spots soon. Heck, I may replant the whole area this fall just to get it thicker. Twenty years ago they said you couldn't grow anything on tailings." To date he has reclaimed some 1,000 acres on the pond flanks, at an average cost of \$25 to \$100 per acre.

Rokich reminded me of an old-fashioned dry land farmer, working patiently with the land, persevering to make it grow. "I watch the weather like a hawk," he told me, and when conditions are right "you have to go day and night to make [reclamation] pay."

Offering advice to the new breed of reclamation workers, Rokich suggests "a good, well-rounded education with plenty of math, philosophy, and history—natural history: without a background in natural history you can't deal with these problems. And, above all, get out and hike those hills, get to know the land and see what's growing."

Advice for the regulators? "Get out of our way, we're the ones reclaiming the land, not [the regulators], and don't spend so much time indoors." They have to realize that this is a capitalistic society ... and society wants these resources. If anyone is going to leave this land in better condition, it will be the resource users, not the regulators ... we've been [reclaiming the land] for 40 years." The EPA is in too much of a hurry. "They never gave us a chance to learn ... nobody else knows how to do it. Give us more time; it's the plants and the animals that tell the story."

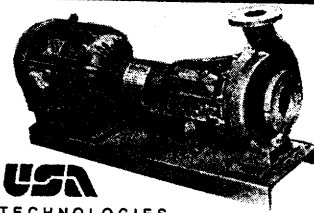
Driving lower, down those stepped flanks of the tailings pond back to the gate, Rokich showed me 40-year-old Russian Olive trees, some 15 feet high, surrounded by grasses and shrubs. "This is where the deer spend their days," he explained. "We have over 800 head of deer on the property now; these slopes are full of deer and foxes ... and 26 bull elk now overwinter in an old quarry west of here."

Asking if the deer and elk eat much of his reclamation work, he answered, "Of course they do, that's why they're here; in fact, they're the proof [of our success] and that Kennecott cares for the land ... the animals tell the story. You have to accept the animals along with the plants ... give nature a little help to get started and get out of the way."

Paul Rokich is now well-recognized for his work, receiving awards and attending reclamation conferences. But his true satisfaction comes from the land for which he has worked so long. Looking high up on the ridge, perhaps 2,000 feet up the mountain, he pointed out two trees. "Do you see those trees up there? They're finally getting past the elk—that's my reward. Looks pretty good, doesn't it?" Thanks to Paul Rokich the mountains around Kennecott do look good, and they show us that reclamation can be very successful—with some well-directed, patient work, and lots of time.

*Geoffrey Elliott is a free-lance writer and regular columnist for Mining World News. He writes about mining, the environment, and balanced use of our natural resources.*

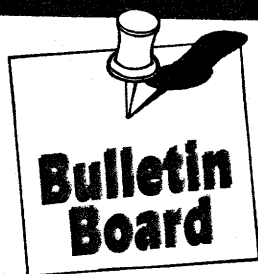
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A 3-day short course on using AutoCAD for Mining, Geology and Environmental mapping and other applications will be held at several locations during 1992 and early 1993. The dates and locations are as follows:

June 19-21, Pittsburgh, PA  
December 3-5, Spokane, WA  
September 1-3, Denver, CO  
January 14-16, 1993, Houston, TX  
October 22-24, Las Vegas, NV  
February 18-20, 1993, Reno, NV  
October 29-31, Cincinnati, OH

The principal instructor will be Michael Slinn of Slinn Engineering, who has extensive experience with AutoCAD software development and applications for the natural resource industries. The emphasis is on practical application of AutoCAD to daily work needs of the participants. Participants must have a working knowledge of 2D AutoCAD Release 10.

For information on cost and registration, contact Gibbs Associates, Boulder, Colorado, tel. 303/444-6032.

Dept. of the Interior

The BLM presented Cordex Exploration Company, based in Reno, Nevada, a Riparian Stewardship Award for assistance in maintaining a riparian enclosure. Through a cooperative agreement with BLM, Cordex agreed to maintain for five years 12 miles of enclosure fence the BLM had built along the South Fork. Over the past three years, Cordex has contributed more than 220 hours of labor and all the materials to repair and keep the enclosure in good condition. As a result, sedges and forbs are stabilizing the stream channel and young willows are getting established.

**MK Explores Mongolia**

Morrison Knudsen Corporation has signed a venture agreement with Mongol Erdene to develop a gold mining property in Mongolia.

MK CEO William Agee said the company's MK Gold subsidiary will explore, develop and produce gold from the Boroo Gold project, 80 miles northwest of Ulaanbaatar. Exploration of the project reportedly identified in excess of one million ounces of proven and probable gold reserves.

MK is preparing a two-year study of the project and will serve as venture manager and operator. The company owns 49 percent of the venture.

Agee said MK is exploring additional mining opportunities in Latin America, Southeast Asia and the Commonwealth of Independent States. MK is meeting with Mongolian officials to discuss development of other metals operations.



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